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[Thomas

M2T

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Not in Goldsmiths

Not in BNC or Halket & Laing

See D.N.B. - author's house at Feltham  
discussed in the text (p. 8).



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SOME  
OBSERVATIONS  
ON  
THAT DISTEMPER IN TIMBER  
CALLED  
THE DRY ROT.

*By D<sup>r</sup> Denman M. D.*

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1795.



## OBSERVATIONS, &c.

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SOME years ago having unadvisedly purchased a house in which there was much decayed timber, and afterwards finding this was justly attributed to what is called the *dry rot*, I have had sufficient reasons for attending to that distemper. When I first saw the mischief done, I was so entirely ignorant, that I had no other apprehensions, than such as arose from a calculation of the immediate expence of repairing it; but have since found *that* to have been a small part of the consideration. Though the following remarks convey a very imperfect idea of a subject hitherto much neglected, I hope they may be the means of inciting better informed men to consider

it\*; and if any method of preventing or curing the distemper should be discovered, great inconveniences and heavy expences would be saved to the owners or inhabitants of such houses. Much satisfaction would also result to my own mind, if, by my error, others may be rescued from such detriment.

In *Leviticus*, chap. xiv. there is an account of the leprosy of a house, which seems to have been the *dry rot*, and I must beg leave to take notice of the passage. It is there described as “a plague in the walls of the house, with hollow strakes, greenish or reddish, which in sight are lower than the ground.” The means directed for its cure are, to take away all the distempered parts, by removing the stones affected, and scraping

\* When these sheets were ready for the press, I was informed that the *Society of Arts* had offered premiums for the discovery of a method of preventing and curing the *dry rot*, and that some observations on that subject had been published in their Transactions. *They offer only 30<sup>£</sup>*  
the



the walls within and without, carrying the corrupted materials to a place without the city. If after a certain time the distemper was found to return, it was called a spreading leprosy; the priest was enjoined to destroy the house, and the materials with which it had been built, were never to be used again for the same purpose.

I shall not make any observations on the devotional part of the ceremony, but it appears that the Jews suspected the distemper to originate from the ground, though they only removed the infected parts; that running water was used in the ceremony; that the old materials of such houses were never used again; and that such houses were considered as unhealthy and dangerous to the inhabitants; but for the last opinion, as far as I know or have seen, there is no foundation. #

Had I time to consult a variety of au-

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thors,

# *Plagues, Pests &c in the Jewish Theocracy, or State, were to be removed by the Hand of God, or by Miracles, in correspondence with the State*

thors, I might probably find many other remarks relating to this subject. But in truth, what I have to say will be chiefly composed of such observations or conjectures as have occurred to me from seeing the state and progress of the distemper in my own house, of which I may be allowed to speak plainly, or of such as I have collected by inquiry, or in conversation; and there is much reason to suspect that the care generally taken to conceal the knowledge of the distemper, when it existed in a house, has been one of the principal causes why we do not at present know more of the *dry rot*. I find also, that the little which is known on this subject by artificers, is often concealed by them with much affectation of importance.

Perhaps the best method of acquiring any accurate knowledge of this distemper would be,

First,

First, to study the general nature of the soil in which houses affected with the *dry rot* are built.

Secondly, the accidental or adventitious causes of the *dry rot*.

Thirdly, the effect of the *dry rot* on different kinds of *stone*, and other hard materials used in building.

Fourthly, the effect of the *dry rot* on timber, and the kinds of timber most readily affected by it.

To these might be added, miscellaneous observations, containing an account of the peculiar effects of the *dry rot* in certain situations; and of the means used, with or without success, for preventing, or curing timber affected with, the distemper. It is not without the greatest diffidence that I mention this arrangement, from a consciousness of the very imperfect manner in which I have been able to execute my own design; but

many allowances will be made for the first essay on any subject.

My house is situated on the north side of *Sunbury* common, which, though a flat, is called a *hill*, I suppose, as *lucus a non lucendo*, but it is so named in *Speed's* map of the county. During the winter, if there happens to be much rain, a considerable part of the common is covered with water, not only in the pits which have been occasionally made, but from the mere level of the common; and in times past it is not unlikely but a great part of it may have been overflowed by the *Thames*, which is not far distant. The floods in the year 1774, and in the last winter, rose enormously high, and though, strictly speaking, they did not reach the common, from the amendment of the channel of the river by its navigation, and by the banks being raised where the nature of the ground would allow



allow of it, they made great devastation in many of the neighbouring parts. But the constitution of the soil is such, that the water is soon drained through the gravel, so that the common, except in particular spots, is not swampy, nor rushy, nor mossy, but covered with heath and gorse, or a fine turf, as is the case in almost all healthy, but uncultivated land. The common, though somewhat lower and flatter, is not unlike that of the vast tract of land, *Hounslow* heath. Scarcely any trees grow upon the common, but in the appropriated parts there is no difficulty in raising them. At *Littleton*, the highly respected owner, now in the eighty-seventh year of his age, has had the satisfaction of planting and seeing many a fine tree flourish; and at *Kempton*, the last residence of the famous *Sir John Chardin*, which adjoins, and is nearly on a level with the common, there is an abundance of very fine trees, oaks, elms, beeches,



beeches, walnuts, &c.; which have not only arrived at their full growth, but are many of them of a century's standing. One of my neighbours assured me, that some cupmofs oaks which he planted on the common two years ago, have in that time shot more than seven feet. I therefore conclude that the principle of vegetation is generally vigorous and healthy over the common, though elms seem to be the favourites of the soil, and it has been said that none of the tribe of firs acquire their full growth or beauty, and that they do not endure their accustomed time. There is nothing apparent in the nature of the soil which should render houses built upon it subject to the *dry rot*, though patches of it may be altered or corrupted by the long lodgment of water upon them, or by being made constantly damp from imperfectly erupted springs. It is reasonable to believe if a house be built on ground ever so pure, but was in

its site to include one patch that was depraved, the *dry rot* might be produced in one part of the house, though every other part were perfectly healthy.

The house I purchased has been built upwards of fifty years, but for the last twenty-five, though always inhabited, had been grievously neglected. When I took possession of it, there was a great quantity of rotten timber in various parts of it. When the roof was taken off, the plates and breffumers were found decayed; when the wainscot was removed, the ends of the beams were in the same state; and the farther we proceeded, the more discouraging every thing appeared. I now believe it would have been wise to have taken out the whole inside of the house, though it was then judged better to repair. By time and perseverance all the difficulties were overcome, and when the house was made habitable, I had time to review what was past, and the mortifying opportunity

opportunity of observing the future progress of a distemper, the effects of which had for the present been removed, but which soon shewed a disposition to return.

Care was, however, taken in repairing to use as little wood as possible in those parts which had most suffered before. The entrance, instead of being wainscotted, was stuccoed (but absurdly enough, a skirting-board was added), and wherever it was necessary to set *uprights*, the floor was paved with stone as a security. One small room which was very much affected, after taking up a part of the floor, and stripping off the lining, I have yet suffered to remain in the same state, from a persuasion that the distemper would be reproduced if it were immediately repaired.

There has since been no token of the *rot* in any of the upper parts of the house, but the entrance, which is paved with *Portland* stone, and which is constantly

stantly exposed to a current of open air in different directions, the doorposts of an inner door, dividing the fore from the back entrance into the house, are entirely decayed, with some part of the skirting boards, though other parts are perfectly sound; the decayed and the sound not being many feet asunder. On those parts of the floor where the wood which stands upon it is decayed, the stones are perpetually damp in every kind of weather, and the wood universally began to decay at that part nearest the ground. From these premises, supported by other observations, I have ventured to draw these conclusions. 1. That the cause of the *rot* in timber is derived from the ground. 2. That the ground which produces this distemper is always damp. 3. That the stone most commonly used for paving floors does not intercept the cause of the rot.

*Seat of the*

*Ground d*

*Stones no prevention*

What

2. - *There may be Instances where the Rot is produced from dry Ground.*



What chymical alterations may have taken place between healthy and distempered ground, before this becomes capable of producing the *rot*, I cannot tell, though in a full investigation of the subject it would be necessary to inquire.

{ The mechanical effect of these is perpetual dampness, and the rotted earth found in sinks and such places gives me a notion of it. This earth I presume, is become, by the changes it has undergone, from some principle perhaps analogous to fermentation, deprived of its natural powers of vegetation, which it might recover by being exposed to the air, or by admixture with other bodies. For the present such earth has acquired the property of producing the *rot*, which, as far as I know, may be a perverted vegetation, and till we have discovered a method of altering its present qualities or correcting its influence, the only effectual remedy for preventing the *rot* will



will be, *to remove such distempered ground.* *where the*  
 When this ground is removed, and drains *seat of*  
 made if thought needful, the vacuity *Distemper*  
 should be filled up with some healthy *lies deep*  
 substance not susceptible of the distem- *may pass*  
 per, such as broken glass, clean pebbles, *through*  
 a portion of unslaked lime, the refuse *new ground*  
 of vitriol works, and the like; but *this Rem*  
 we should remove all the discoloured *is doubt*  
 ground, and not satisfy ourselves with a  
 layer or thin coat of these substances.

Perhaps the nature of this distempered ground may sometime be discovered by knowing what it is not. I found a wooden stable on my premises, built in the usual manner, with a frame, an outside covering of deal boards feather-edged, and a lining of flat unpainted boards. This had stood more than fifty years, and when it was taken down, though the timbers were wormeaten and decayed, there was no token of the *rot* throughout the building. Frames  
 of

of cucumber and melon beds, though in constant use, and standing on a substance that might be suspected as likely enough to produce the *rot*, will endure for many years, and at last perish, without any tokens of this distemper; one might therefore conjecture that animal substances of this kind do not generate the *rot*.

Objections may be made to the opinion of the *rot* proceeding universally from the ground, because it has been discovered in parts of houses which had no direct communication with the ground, the intermediate timber being clear, as in garrets and particular parts of houses. At the first view this should have originated in the timber itself, or in some substance with which that was in contact or had a direct communication. This happened in the house of one of my friends, who is a very competent judge of the fact.

He one day observed a single pannel which was cracked, on the wall side of his

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Earthen*

*of the  
not pro-  
ing from  
ground.*

his drawing-room, exhibiting tokens of the *rot*, though every other part of the house was clear of the distemper. On removing this pannel he found a large cake of the fungous web, which accompanies the *rot*, filling the space between the pannel and the wall; but tracing this, he was led to the water-pipe, which some time before having been choaked, the water had regurgitated over the cistern of the pipe, and flowed on the outside of the wall to the ground. This had continued so long, or been repeated so often, that opposite to the injured pannel it had washed out the mortar, and soaked through the wall itself, till the opposed pannel became affected with the *rot*. This brings us back to distempered ground, and a moment's consideration will shew how readily this may happen in garrets, in which the soaking of water is disregarded if it does not descend to the principal rooms. It will not how-

ever be hence supposed that all moist ground is capable or disposed to produce the *rot*, but ground so corrupted by continued stagnating moisture, as to become deprived of its natural properties, and to have acquired a perverted principle of vegetation; or a power of giving to wood such a property as shall generate the process by which the *rot* is produced. On inquiry it will probably be found that there is a great difference between the moisture given to wood by stagnating or running water, and between simple moisture, and moisture mixed with corrupted substances. It is also to be remembered, though the wood nearest the ground first begins to decay, that the infection will soon spread to a distant and healthy part, if there be a medium of communication by which it can be conveyed.

In every neglected or uninhabited house, if the pipes be choaked and over-  
flow,

*rot from  
 stagnate  
 rains*



flow, the water running between the wall and the wainscot may escape to the ground, and if it has a proper drain, do no mischief. But if there be a repetition of these overflowings, so that any piece of timber becomes soaked in the passage of this water mixed with the sweepings of the roof, in a place not exposed to the air; or if the water should rest afterwards on a spot of ground with which timber comes into contact, the *rot* may begin in this one part, and then spread its devastation around. Thus the foundation of a general *rot* in the timber of a house may be laid by neglecting its first appearance. But this kind of *rot* admits of a certain cure if it be undertaken in a proper time, and the method effectually completed. Yet the first expence is sometimes so great that people are willing to lessen or evade it, if they can find any plausible reason to satisfy their minds. But this is very bad hus-



bandry. There is a very handsome house in one of the streets leading to *Grosvenor Square*, which was so greatly and repeatedly infested with the *rot*, that the owner sold it, for this reason alone, far below its real value. It was then purchased by a nobleman who understood more of the distemper, or used more effectual means for curing it, which succeeded, as I am informed it is now free, the nobleman at the present time living in it, and it is supposed to be worth three times the sum it cost him. I presume that the *rot* in this house was merely caused by the overflowing of the pipes, which might at length have produced the distemper, perhaps some years after the circumstance was forgotten, no other houses in that street having the *rot*. It should be remarked, though I do not know that it is of much consequence, that the *rot* ASCENDS from the

part

part where it was formed, and does not descend or spread much laterally.

In some houses the *rot* has been attributed to air corrupted, or acquiring chymical properties destructive to timber, from its mere confinement, without the mixture of any other substance, or any exhalation from the ground. If common air by confinement alone acquired the property of producing the *rot*, certainly very few houses could be free from it, because there is in every one some place or other of this description. But this opinion is very much to be doubted, and it is probable the mistake might arise from the timber having gone through the first part of its process without notice, till the wood, by cracking or being in a mouldering state, drew attention. But when the genuine cause of the *rot* exists, the progress will be more rapid in a confined than an open place; though my door posts, exposed to the open air

*This is a mistake it both descends & spreads laterally a great extent where it finds a Conductor of Wood or Stone*

in two directions, have decayed in about three years, and they are not fixed in the ground, but on a stone pavement.

There is usually no area round houses built in the country, or rather, many are built without one. In certain situations, if the ground be much higher at the back than the front of the house, the disadvantage is soon evident from the dampness and discoloration of the wall, especially if it be covered with stucco or plaister, whether or not the *dry rot* should be produced, as well as in the general look of the house, which is apt to become straked with green, and mossy. It is certainly best, on many accounts, to have an area, if possible, to all houses; for, though healthy earth lying against the walls of a house, will not, I apprehend, produce the *rot*, much is to be apprehended from tainted or distempered earth. I advised a gentleman in *Worcestershire*, who applied for my opinion

on

on account of the unhealthiness of the cottagers in his neighbourhood, to have a trench or drain round every cottage, that no more water might lodge than fell within the site, and to have back as well as front windows for the purpose of ventilating them. For this purpose it is also much better, and not more expensive, to have sliding windows or sashes. But this is a digression, though on a subject which has very much engaged the attention of a lady distinguished by her genius and her humanity.

If the part of a house affected with the *rot* be near the outer wall, probably a fough or drain would be of much service, and the wall might, without damage, be perforated, and then the cause of the damp would be more effectually removed.

Stone often becomes affected with this distemper, of which I had for a long time no suspicion, and, as was before observed,

*Stone a Condu-  
tor of the Ro-  
& also imbibes  
it.*



the softer kinds do not intercept the cause as it rises from the ground. There are various kinds of stone used for pavements, the most common of which is the *Portland*; next to this is the *Purbeck*, taken from the same quarry, but of a harder texture, perhaps because it has been longer formed, or more exposed to the air; then the *Yorkshire* slab, not so pleasant, but harder than the *Purbeck*; and there is likewise in use a red stone cut into squares or lozenges, brought from *Bremen*, and a blue stone of a similar kind, but somewhat harder, from *Sweden*.

My entrance is paved with pretty large slabs of *Portland* stone, which is constantly damp in that part where the *rot* has again appeared; and it is spotted with white blotches not unlike leprous spots upon the skin; and by these appearances I can with ease trace the extent and progress of the *rot*. In the saw-  
ing



ing of stone which might be pretty dry when it was submitted to the instrument, so much water is used, and for so considerable a space of time, that the stone is thoroughly soaked; and it is the custom to lay down the stone while in this state, to which the same objection may be made as in timber newly worked up, and immediately painted; of the reasons for which we shall afterward take notice. But the dampness of the stones before observed, is not occasioned by the moisture with which it was imbued before they were laid down; for though they were all cut at the same time, and many of the slabs from the same block, none are now discoloured or shaded with the damp, but those which are placed where the *rot* exists. It is therefore reasonable to think that they have not retained their original moisture, but that they are become moist from the peculiar influence of the ground on which they are laid.

I think

I think however that I have seen stones with slight marks of the kind above mentioned when they were first cut, and thence conjecture that the disposition to decay may originate in the quarry, from earth insinuated between the *laminæ* of the stone, or from some other cause, becoming corrupted. If stones with these marks are laid on healthy ground, or used as steps where they are surrounded by the air and kept dry, the spots do not, I think, increase in number or size. But if such stones were to be laid on distempered ground, though they might not immediately give rise to the distemper in other materials, they would be more susceptible of it, and more readily convey it than if they had been originally healthy. In houses built or faced with stone, I have also often seen stones with such tokens of imperfection, and they are the first to decay. In that beautiful house of Mr.

Milnes,

*Milnes*, in *Piccadilly*, many of the facing stones have decayed with such marks upon them, and some of those newly put up, have them. Yet it must be remembered that the more speedy decay of some stones may also depend upon other causes, such as their being cut or placed in a wrong direction.

The *Purbeck* stone is of the same texture, and has the same properties, as the *Portland*, though harder; and it is on this account less susceptible of impressions from the cause of the *rot*. The *Yorkshire* flab is very hardy, and composed of different substances as well as different in its texture; of course it is fitter for hazardous situations. The red stone imbibes the moisture freely, and conducts the distemper, which makes it flake; as does likewise, I understand, the blue stone, though in a less degree. Gritstone, which seems to be composed of distinct granulations, would probably  
 suit

suit very well, and for passages, especially those below the ground; the granite, now commonly used for paving the streets, would make a sufficiently convenient and durable pavement. But all stone easy to cut, either from the softness of its substance, or the sponginess of its texture, seems improper in every place liable to the *rot*.

This distemper seems to have no effect upon brick walls or on bricks, provided they are well burnt, and layed with good mortar, farther than from the simple effect of moisture; but soft bricks, or bad mortar, when operated upon by constant damps, have been supposed to give a rooting place to it. Though it does not penetrate into the substance of a brick wall, the *fungous* wall may often be seen mantling over its surface, yet without hurting it. But if it chance to meet any wood in its passage, there it fixes and seems to acquire fresh vigour, if there



be any degree of moisture, but not in absolutely dry places. As bricks are found not to be affected with the *rot* or its cause, the observation may on various occasions be turned to good account, by saving the use of timber, in places where it might be expected speedily to decay. Store rooms of every kind might be more suitably fitted up, and with some ornament, with rubbed or glazed bricks of different forms, in the manner of Mr. *Cartwright's* patent ones; or with tiles of various kinds and colours. The house in the south-west corner of *Hanover-square* is a beautiful example of fine brick work; and the fashion of making paper to imitate brick, is a proof that it would not offend.

Stucco, and plaster of the coarser kinds, seem to suffer no injury from the *rot*, (notwithstanding the flagrant negligence with which mortar of every kind is mixed) except from simple moisture.

When

When these are laid on walls, there is no occasion to consider the subject as far as they are concerned, but when, for the purpose of making plaister partitions in dangerous places, it is necessary to set up stanchions, or to use laths, these will soon decay, and then the partitions fail. Instead of such work, the expence of raising a brick partition in the first instance, when we are not sure that the earth is sound, will on the whole be the least, and the work far most permanent.

The injury done to stone does not, however, render it unfit for the purposes for which it was designed, and many years would pass before it were actually so decayed as to moulder, though it might be blemished to the eye. The principal misfortune to a building is when timber is affected, because of the repeated trouble, and the expence of repairing it.

The manner and the time in which

each particular kind of timber naturally decays, is now pretty well understood. The constituent parts of which it is composed lose their connection, but preserve their form, in such a manner that each kind, though wholly decayed, may be distinguished. But in the *rot*, the very form or internal structure is destroyed, so as to render them all nearly alike. The wood becomes moist, decays, shrivels, then cracks and breaks as if it had been parched by lying for a long time near a strong fire, or as if it had been soaked in some destructive liquor.

In places affected with the *rot*, the wood next the ground will certainly first decay. Skirting-boards, which are in fact neither useful nor ornamental, and which are always made of slight boards, exhibit their tokens by becoming spotted or producing the *fungus*, especially at their junction with each other; the mouldings, if there be any, round the doors;

doors; then the steppings of joists, door, and other posts, of whatever kind. I also observe if two pieces of wood are joined together, that the distemper makes a quicker progress, by running between the united surfaces, than in one piece of equal dimensions. The slightest work is always first affected.

Different causes taken from the timber itself have been assigned for this distemper. Some have supposed that timber cut from trees which grew in certain situations was peculiarly liable to the *rot*, those which were taken from very moist situations being judged to have the greatest propensity to it; and the lower parts of *Essex* have been expressly mentioned on this occasion. There may be some truth in this as a general reason, because oak, or any other timber, growing in *America* or *Britain*, for instance, may vary in the time of its natural duration. Yet the mischief arising from this cause  
will



will be so slow in its operation as to be hardly perceptible, if it should even amount to one quarter of its time, unless it were employed on some particular and equal service. No timber of any kind has however the power of withstanding the *rot*; they all yield to its influence, scarcely varying in any other respect than the time of enduring its effect.

With regard to the natural duration of timber, I believe it has been proved, that much depends on the time of barking and felling trees; the time they are kept after they are felled before they are worked up; the manner of keeping them; and the time which passes before they are used, when sawed or cut into planks or beams. It has even been asserted, that a moiety of their duration depends on these circumstances; and for these reasons, perhaps, mahogany is so stout and lasting a timber. The age of the tree when felled may also be of great

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importance.

importance. But unfortunately it is the custom to neglect all these points in timber used in buildings, especially as so great a number have been raised within a very few years. Even the most valuable oaks have been managed so that when they are filled, the bark shall easily peel, and be ready for the best market, with the view of saving the interest, or of procuring a quick return of money; and trees cut down in one season have been, without hesitation, worked up in the ensuing year, making the goodness or badness of the timber, provided it appeared well, a matter of secondary consideration. For the purpose of working more easily, and perhaps of measuring better, the fir beams, stored by the timber merchants, are generally kept soaked in water till they are sawed and prepared for their specific uses; and then they are forthwith fixed in buildings, long before the moisture they had acquired

quired can be exhaled. Hence may be explained that shrinking of the floors and wainscoting so obvious in all the new-built houses; though I understand that all timber, however well preserved, newly worked, has for a certain time a tendency to shrink, in a small degree.

In ship-building, in which the greatest possible care is taken to preserve and work the timber when in its most perfect state, it is a rule carefully to choose the proper time of barking and felling the oaks, of keeping them till the native moisture be exhaled, of soaking the timber, and again keeping it in a dry place, even within the influence of the fire, for a long time before it is worked, and then again after the planks and timbers are formed for express purposes; and it will scarcely be believed how great the difference is, between ships built with these precautions and those in which they are neglected. How far such observations

may apply to timber used in buildings, I cannot tell, though it is reasonable to think that whatever accelerates the natural decay, may dispose to the *rot*, or at least render it a more speedy victim in infected places; so that some attention ought to be paid to these matters, with timber intended for buildings.

The propensity in timber to be infected with the *rot*, and its speedy decay when affected, certainly very much depend also on the looseness or closeness of its texture, and for this reason fir is the least eligible, though of late it is almost the only kind used in buildings; and it would be difficult to provide any other in a sufficient quantity. But of the respective or comparative goodness of all the other kinds of timber for particular uses, I am unable to judge. There is another obvious reason also why the step-pings of posts and uprights should soon decay, besides their touching the ground,



ground, from which the infection of the *rot* is received. The end of every post is sawed off, and if this be done with a coarse instrument, it is left spongy, with the longitudinal fibres shook or broken a considerable way within the extremity of the wood. In this state the ends of the posts must be apt to absorb from the ground the pernicious moisture or exhalation, which being retained, and speedily pervading the whole internal substance, this may be rotted, while the external surface, especially if painted, appears to be perfect. Artificers can tell by the sound of any substance whether it be healthy or decayed, as accurately as a musician can distinguish his notes. Thus a bricklayer strikes a wall with his crow, and a carpenter a piece of timber with his hammer. Timber affected with the *rot*, yields a particular sound when struck, but if it were painted, and the distemper had made much progress,

with no severe stroke the outside breaks like a shell.

I am pretty certain that in situations obnoxious to this distemper, painting forwards its progress, and probably in this manner. If the moisture be absorbed from the ground into painted wood, it will be confined there, the paint when dry forming a crust, which prevents every degree of exhalation, depriving, at the same time, the wood of the salutary influence of the open air; and the moisture thus absorbed runs through, and insidiously destroys the whole substance. But if the wood were not painted, some portion of the moisture would exhale to the surface, and be dissolved by the circumambient air. If there were flaws or junctures in the wood, the *rot* might shew itself sooner, but the decay of the wood would be slower.

In some situations wooden posts fixed

in the ground speedily decay, not perhaps by the *rot*, but by some property of the ground accelerating its natural decay. To prevent this, it is customary to dip the ends in melted pitch, or to give them two or three heavy coats of tar; but many have doubted the efficacy or propriety of this method. It is clear that in fixing the posts, some part of any brittle matter must be shivered off, and a small vacancy may admit the mischief; or if any moisture should insinuate between the coat and the wood, the injury might be forwarded, and not prevented. An apparently more reasonable method, much practised also, is, to scorch the foot of the post in such a manner that the outside texture may become harder and closer from the shrivelling of the wood; as the *Indians* burn the points of their spears, giving to them by that method almost the hardness and sharpness of metal. It is remarkable that in fir de-

stroyed by the *rot*, there is not the least remnant or vestige of resin or turpentine, which in fact seems to be the substance first preyed upon. From these premises we may presume to come to another conclusion, that in places subject to the *rot*, *fir is the most unfit kind of timber to be used*; and perhaps to another, that timber fixed in such places, *should stand a year or more before it is painted, or that it never should be painted*. There is one pannelled room in this town, which was never painted, and instead of offending, it is rather agreeable to the eye.

In hazardous places, it would be a great preservative to posts fixed within doors, if the communication between them and the ground were to be cut off by some substance that could sustain no injury, or which would not convey the *rot*. Thin plates of iron or tin, first occurred to me as most suitable to this purpose;



purpose; but probably a plate of sheet lead, of a proper size, would answer better.

In the counting-house of a merchant in the city, the wood was very subject to the *rot*, and in order to cure it, a brick arch was thrown underneath the counting-house and over a cellar, but after a certain time the distemper returned, though it was less rapid in its progress. In this case I suspect that the arch of the vault was covered with the rubbish of the old corrupted materials, or other unwholesome stuff. Had this been covered with broken glass or clean pebbles, or been covered with good mortar, or had a brick floor been run over the arch, or had the room been set over the arch, upon cast-iron piles, I apprehend the distemper would have been prevented.

*Case.*

In the course of this summer a person discovered the floor of a sitting parlour

*Case*

to

to be almost wholly destroyed by the *rot*. When the floor was taken up, an immense quantity of the fungous web, which ever accompanies the *rot*, was found between the floor and the ground.

To prevent the distemper in future, the ground was paved with stone, and the new floor laid upon the pavement. It remains to be proved whether the distemper will return; but unless the stones were hard and sound, and laid so accurately as to interrupt all communication with the ground, I suspect it will. All the tainted ground should have been cleared away, and the vacuity filled up with healthy materials, void, if such could be procured, of all vegetating principle; or if this could not have been done, it would have been better to have made the pavement with hard, glazed, or vitrified bricks, set in a thick bed of fresh mortar, or terrace, than with any kind of stone.

Dryness

Dryness and warmth seem at the first *Dryness &*  
 view, as if they would greatly resist, if *do not der*  
 not perfectly abolish, this distemper. *or prevent*  
 These relate to the air, unless by a great *Rot.*  
 degree of heat the moisture of the earth  
 or stones could be absolutely done away,  
 or the quality of the earth changed by  
 actual burning, or perhaps by a free use  
 of quick lime, which would produce an  
 equivalent effect. I have lately heard of  
 two accounts which go against this opi-  
 nion, but one of them is taken from the  
 newspapers. The hearth stone, of a very  
 large size, in a kitchen, was said to be  
 raised out of its bed by a vast number of  
 small *fungi* growing underneath. This  
 case is imperfect, as it did not appear  
 whether this circumstance was local, or  
 whether any other part of this house was  
 infected with the *rot*; but it shews that  
 a very considerable degree of heat does  
 not hinder the generation of *fungi*, which  
 invariably make a part of the *rot*, though  
 it

it would be presuming too much to say that all ground disposed to produce every kind of *fungus*, is infected with the *rot*.

*Case* In the house of a friend of mine the ends of the beams which support the floor of a parlour over a kitchen in constant use, were affected within the wall to such a degree, that the floor was very near falling into the kitchen. On inquiry I found that the same circumstance had happened a few years ago, when the house was repaired at a great expence. This is not only a proof that simple warmth does not prevent the *rot*, but of the insidious manner also in which this sometimes makes its progress.

In some districts one certainly hears of many instances of the *rot*, while in others there is a total exemption from it. I very much doubt whether this distemper has ever been heard of in many parts of the country, though in others the value of property (in houses) is very much debased



bascd by it. All this may be reconciled to the idea of native ground, uncorrupted, not producing the *rot*, by supposing that the face of a country has been partially or generally very much altered by accidental causes, that these may have occurred more frequently in some places than in others, or that some native soils may from flight causes, be more prone to produce the *rot* than others. I have heard it asserted that in some parts, fruit trees, especially those of the more delicate kinds, become affected with a distemper which in seven or eight years destroys them. This has by some been assigned to the importation of distempers with foreign trees. The leaves, or something blown from the *Lombardy* poplar, are suspected to be particularly injurious to fruit trees; but these are both in management and culture *ab origine*, rendered so artificial, that one is not surpriscd with any new disposition

position they may acquire. In a very handsome avenue of elms which leads to the house of one of my friends, and which was planted about sixty years ago, though the trees are full grown and appear generally healthy, of late, every two or three years, one of them has failed. They first cease to bear leaves, the bark becomes discoloured, and between this and the bole there are an infinite number of insects, probably not the cause, but consequence or effect of the decay; intimating also the parts first dis-tempered. It was proposed to cut off the tap root to preserve the rest, on the common notion, that when this dips beyond a certain depth, it may reach a bed of something noxious which it imbibes and conveys to the tree. But on inquiry the tap root was found to have been already cut, and a flooring of bricks laid to prevent its regeneration. It seems from this precaution that former trees had suffered  
in

in the same manner; or perhaps this method had been practised to make the trees grow faster at the expence of their duration, as was done, according to the account given by a traveller, with the avenues leading to one of the palaces in *Spain*, which prematurely growing, soon decayed. In the first description of *Botany Bay*, it is said that many of the trees appeared as if they had been struck by lightning, though it is possible this might be attributed to similar causes with the trees to which we have here alluded. In *St. James's Park* there are at all times examples of trees with this appearance. In some *Spanish* plane trees, planted near the new lodge in the Green Park, there is at this moment a very curious circumstance. The outer bark of every tree is scaled off, but whether it be a morbid or natural effect in that kind of tree I cannot tell, though I

was

was told it occurred annually in trees of this kind.

The *rot* has appeared in some churches, and in one the progress has been so speedy, and the necessity of repairing so frequent, as to create a grievous expence to the parishioners. Here it will often be impossible, or, which is nearly the same thing, improper to remove the ground, though disposed to produce the *rot*; yet I think it might be prevented by the following method. The pews seem to be the principal parts which can be infected, and instead of flooring them on the ground, I should propose, that two or more of these should be built on one frame, which instead of resting on the ground, should stand on a proper number of cast iron piles or casters, by which the communication with the ground or wall would be hindered; and if the conjecture of the cause of the *rot* be just, the pews  
would



would escape any injury. But to render the success more certain, it would also be proper to pave the ground with some firm stone or hard bricks. For the houses of the parochial clergy in situations subject to the *rot*, I have a notion there is a saving clause with respect to dilapidations, but the expence must fall somewhere, or the houses would come down. If an incumbent should arrive at old age, keeping such a house in comfortable repair, would in his life-time be a terrible deduction from the profits of any living.

The *rot*, as far as I know, does not affect metals farther than as common moisture, and no metallic substance will conduct the *rot*. *metals no Conductors of the Rot* It is curious to see a door perfectly sound hanging on a post so much decayed, that it would not bear new staples or hinges to be fixed. This must arise from the interruption of all communication with the decayed post

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by

by the hinges, on which the *rot* cannot make any impressi<sup>o</sup>n, or which it cannot pass, or by which its peculiar quality will be corrected.

Close to the houses of many gentlemen, for the purpose of levelling or raising the ground, it is often necessary to bring materials from some other place. There has been much work of this kind <sup>#</sup> about *Kensington Palace*. For such intentions, great care is to be taken that healthy materials are used, otherwise the *rot* may be brought to the house if there be no area; or if there be, it often creeps along the planks or other supporters of stone steps, or in some neglected place, and then it will increase like the polypus, if it finds any moist and decayed matter, on which it can fix. Of whatever materials such ground is composed, a long time passes before it is perfectly dry or settles firmly. It is apt to be mossy, emitting a peculiar, and not an agreeable smell,

<sup>#</sup> One of the Covered Seats or Alcoves in Kensington Garden is subject to the Rot, & altho' the ground near it is damp it does not

smell, on the evening of a hot day, perhaps for a hundred years after it was layed.

It has been much the fashion of late, to fix to the freehold many pieces of furniture, as wardrobes and the like; but in houses subject to the *rot*, this should be studiously avoided.

Almost every person can recollect the state of much of that ground in the vicinage of *London* which is now covered with fair or magnificent houses. How the timber may stand in many of these, cannot as yet be ascertained, but the prospect is, for many reasons, unfavourable. †: The foundation of every house must be layed on the true natural ground, but this is not a sufficient security unless care be also taken to procure healthy materials for filling up vacancies, and perhaps by first skimming off and clearing away any corrupted materials which have been laid on its site. I doubt it is the

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practice

*Whole Streets in the new Building, on the other side Oxford Road, it is said, have the Dry Rot*

practice on these occasions, to take as much of the gravel and better materials as can be disposed of with advantage for other uses, and then to fill up vacancies with the cheapest rubbish that can be gotten. But the expence and hazard of this is generally left to the tenant or purchaser of the house. A small piece of ground behind a house bought by a gentleman I know, was so excavated, that at one time he paid fifty guineas merely for carting the scrapings of a turnpike road, before it was brought to a proper level. It is however very likely, by choosing such materials, that he has preserved his house from the *rot*.

The distemper of which we are speaking, is called by the general name of *rot*, or *dry rot*, but it may perhaps be discovered, at some future time, that there are many varieties both of the distemper and its causes. The prevailing opinion is well known that it is a species of vegetation,  
but



but without deciding with sufficient accuracy upon the primary or predisposing cause, or what the nature of that vegetation is. Some have supposed it to be of the animal kind, and probably because of the observation that places in which snails have been decayed, do not fail to produce mushrooms; which has led, if I mistake not, to a doubt whether mushrooms were of the animal or vegetable tribe; or because no man has yet been able to distinguish where the animal kingdom ends and the vegetable begins, or that no language can exactly define an animal from a vegetable, though every one can clearly distinguish them in his own mind. The first effect which earth capable of producing the *rot* shews, is in its being continually moister than healthy earth, but the moisture is not the substance of the disease, no more than the matter of the small-pox is the infecting principle, which is of the most

subtle nature, and only mixed or enveloped with the matter as its vehicle. So the moisture in earth impregnated with the *rot*, does not seem to be the principle of the *rot*, but it is merely the vehicle or conductor of the miasmata or primary principles of that distemper. It would be worth while to try ground which produces the *rot*, as well as wood affected by it, with electric experiments, whether it abounds with or is deficient in electric fire; but there is a multiplicity of things which an ingenious man, who could spare time, might try, for the purposes of investigating either the cause or the effect of the *rot*; and if he had the sagacity or good fortune to discover a certain method of preventing it, he would do a very essential service to society.

When timber becomes affected with the *rot*, it is the medullary part which first suffers, and as this lies in different portions in various parts of the timber,  
according

according to the straightness or obliquity of the longitudinal fibres, so the blotches or tokens are of different sizes, and scattered irregularly over the surface of the wood; but the sawed ends or sides of wood universally exhibit the first tokens of its being infected by producing the *fungus*. This, which as far as I know may have a proper name with naturalists, has exactly the smell, and something of the look, of a common mushroom, and this *fungus* is also sometimes found behind pannels, yet I think never unless there be some access for the air, and perhaps a certain degree of constant or occasional moisture. In some places I have found what might be called the skeleton of a *fungus*, when from the interruption of moisture, or from its utter decay, the wood was no longer capable of supporting or renewing that which had been before formed. When the *rot* mantles over a

brick wall, it has much the appearance of a thick spider's web, and in its principal feat, where it has materials enough to work upon, or by which it can be nourished, and where it is not for a long time interrupted, there is usually found a large congeries of stuff of the same kind; not, I apprehend, formed without order, but lying regularly in *strata*. All these should be observed with more care, and so important a circumstance as the *rot* or cancer in wood, as it may be called, should not be suffered to pass longer with so little attention.

I cannot conclude these observations, slight as they are, without taking some notice of the means which have been devised or practised for preventing the *rot*, by applications to the timber itself; with a view of rendering wood impervious to, or capable of resisting its influence. The principle of all these means may be explained in two views; first, to fill up all



the interstices or cells of which timber is chiefly composed, with some unperishable matter, or by some contrivance to corrugate the timber, that the cells may be obliterated, or sufficiently closed, so as not to admit of the distemper, something in the manner of tanning leather; secondly, by soaking timber in some fluid impregnated with certain substances that should act as an antidote to the distemper, though put into contact with it, or to render wood impenetrable by it.

Professor *Grassman* of *Stettin* has proposed a method of rendering timber used in building ships more durable, and induced at the same time with particular powers to resist the *worm*. Whether the professor's method would, if it were practicable, have any power in preventing the *rot* in timber used in buildings, I cannot tell, but will beg leave just to mention it, according to my apprehensions of its purport.

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He advifes the oaks to be felled green, that is while the fap is rifing, and then the timber to be made and kept perfectly dry, for fo long a time that all its native moiſture may be exhaled. The timber is then to be foaked in a ley prepared from mineral coal and turf, and fo loaded with ſtyptic or rather antifeptic particles, that ſuch an additional firmneſs may be given to the timber as ſhall make it far more durable; and the materials with which it is imbued ſhall poſſeſs qualities ſo noxious to the *worm* as to deſtroy it, or render wood impenetrable by it. From what I have ſeen, this preparation of timber, though it might endure longer, would make a feeble reſiſtance to the *worm*, and would not be of any great ſervice againſt the diſtemper of which we are ſpeaking; not to mention that the proceſs is too intricate and expenſive to be practiſed with timber uſed in buildings.

While

While we are endeavouring to destroy or to suspend the operation of the native principle which is supposed ultimately to cause the decay of timber, or to qualify it better for particular uses, it behoves us to be careful that we do not in these attempts introduce other principles of decay; a circumstance to which attention has not always been paid. On the whole, it may be doubted, whether by any such means, greater advantage be obtained, than merely by keeping timber a sufficient length of time before it is converted to its particular uses.

It has been proposed to soak timber intended for use in places liable to the *rot* in a solution of vitriol (copperas), or other substances of that kind, so long that it shall be impregnated with them through its whole substance. Of the effect of these methods I cannot speak, having never seen them tried, but in my own opinion, no timber, however  
 7 prepared,

prepared, will long be able to resist the *rot*, or do more than retard its progress.

Artificers are frequently called when the *rot* appears, to give their opinion and assistance in preventing its progress, and they gravely recommend it to be washed with copperas water, or water with new-flaked lime, and the like; and they are not to be blamed because they know but little of what other people are ignorant. These will often destroy the *fungus* which has appeared, and the knowledge of this effect from such substances, may lead to the use of them, in the first instance, to the ground, or to stones layed over such ground; though scorching the part affected with a hot iron would be, in many cases, a preferable method. But the truth is, the timber is gone before the *fungus* makes its appearance, so that every method of this kind must of necessity fail,

It



It being therefore evident that the *rot* is incurable by any method with which we are now acquainted, all our attention is to be employed in discovering the most effectual means of preventing the distemper; and with this view I hope the preceding observations may not be altogether useless.

THE END.

*This Pamphlet is useful as a short History of the Appearances & Effects of the Dry Rot; but Dr. Denman has not penetrated philosophically into the Cause of it, & therefore neither has he been able <sup>to discover</sup> the Means of it's Cure; as no effectual Application can be made to remove a Disease without knowing it's Seat. The Facts adduced, however, are very striking, & show that the Origin of the Distemper lies in the Earth; notwithstanding*









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